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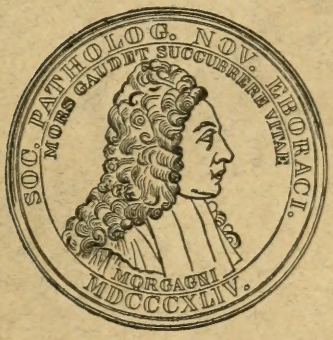
New Series, Vol. IX. Nos. 3 and 4

PROCEEDINGS

OF THE

NEW YORK PATHOLOGICAL SOCIETY



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Dr. Horst Oertel, *President.*

THYROID TISSUE IN OVARIAN EMBRYOMATA.*

F. C. WOOD, M.D.

Dr. F. C. Wood presented a series of specimens. He said that recently a great deal of interest had centered in the presence of thyroid tissue in ovarian embryomata. He used the term embryomata advisedly, because it seemed very difficult to make an accurate separation between a dermoid and a teratoma of the ovary. It was, therefore, better to call the tumors he was about to show, ovarian embryomata and so avoid discussion.

Specimen 1. This was an ovarian cyst which was removed from a woman in good health She had no enlargement of the

* Presented to the Society February 10, 1909; received for publication, June 7, 1909.

thyroid. The cyst was filled with a reddish fluid, and was at first supposed to be an ordinary ovarian cyst. The remnants of the ovary on one side of the cyst were examined and sectioned, and were found to be composed almost entirely of thyroid tissue. The only other tissue besides the connective and thyroid tissue were fragments of bone with Haversian canals. There were no hairs present. This was one of the simplest types of cyst.

Specimen 2. This specimen had been largely cut up for examination, and was originally only a small cyst. No hairs or teeth were found; only connective tissue and thyroid tissue.

Specimen 3. This was a more complicated specimen than either of the previous ones shown. The patient was forty years old, and some time ago had had her breast removed. Although it was impossible to verify the diagnosis, it was assumed that she had had a carcinoma of the breast. Two years after the operation, she entered St. Luke's Hospital complaining of pain in the pelvis, in the coccyx, and in the lumbar region. It was supposed that she was suffering from a recurrence of the carcinoma, and an exploratory laparotomy was done, and a double cyst of the ovary found. There was a parovarian cyst which had collapsed. There was a small but normal tube. The ovary had practically changed into a multilocular growth. All the solid portions of the ovary were composed of thyroid tissue. There were no hairs in the cyst, which was lined with flattened epithelium. There was apparently no formation of bone or teeth. Curiously enough, the thyroid tissue showed the development of carcinoma. The question arose whether this was a metastasis of the breast carcinoma developing in the ovary. There were in the carcinomatous tissue, however, areas like the secreting portions of the thyroid, i. e., colloid tissue. This looked like what one saw in true carcinoma of the thyroid. It seemed to Dr. Wood, therefore, that this was a primary carcinoma developing in thyroid tissue. The patient had had no recurrence from the original carcinoma of the breast, and she was still in good health. Evidently the ovarian

tumor was the cause of the pain in the pelvic region.

Specimen 4. This was a case of interest from the start. The patient was a woman in the German Hospital, who had two ovarian cysts which were very large and contained an enormous amount of hair and sebaceous matter. They were multilocular and contained a number of bony particles and teeth inserted at one point on the wall. There was also a mass of tissue present which could not be distinguished from ordinary thyroid tissue. There had been a sufficient quantity of this material to work on, and by making a chloroform extract it was shown that iodine was present; i. e., the thyroid tissue contained iodine, as did the normal thyroid.

There had been quite a dispute concerning the nature of the tumors, and some observers had considered them folliculomata and as not consisting of true thyroid tissue, but this view had now been given up. These cases were not very infrequent, and a number had been reported in which the thyroid tissue had been formed in ovarian tumors. Pick had stated that he had found thyroid tissue in seven out of twenty-one dermoid cysts. It seemed to Dr. Wood that Dr. Pick must have been lucky, for in his own collection he had never been able to find thyroid tissue, and he had examined more than twenty-one.

The history of these growths showed that they were, as a rule, benign in character, and did not tend to recurrences or malignancy. Probably these tissue remnants were of the same types as the cartilage, trachea, salivary glands, brain cells, etc., which were so frequently found in examining dermoid cysts of the ovary.

Discussion.

Dr. Robert T. Frank said he believed that Dr. Wood's collection of specimens covered the entire ground. A finer collection of specimens of teratomata, or teratomatous growths of this group, could not be found. The specimen of the greatest interest was the one in which carcinoma and colloid goiter were

found together. It was to be regretted that the primary carcinoma removed at the time of the excision of the breast could not be found. Because of this, nothing definite could be said as to whether there was a metastasis of the carcinoma in the teratoma, which would be extremely unlikely, or whether it was a carcinoma arising from the teratomatous growth. He thought the study of the clinical course might help. Teratomatous tumors containing goiter take a more favorable clinical course than do those, for instance, in which metastases of carcinoma localize in the ovary. Clinically these cases were of great interest, because in almost one-half the cases ascites occurs, giving a most malignant appearance. In spite of this, he had been able to collect from the literature but one case which showed a recurrence. Recently he had examined a similar case of teratoma, which consisted of three elements: 1. Bone to which was attached a molar tooth. 2. A corpus luteum. 3. The rest of the tumor was composed of thyroid tissue containing colloid material.

AN UNUSUAL CASE OF LYMPHATIC LEUKEMIA.

MARTIN REHLING, M.D., AND F. C. WOOD, M.D.

Dr. Martin Rehling presented the clinical history of a patient who was the sister of a physician, thirty-two years of age, with a negative family history; married for twelve years; one child nine years old; no miscarriages. The patient had become increasingly pale for one and a half years, felt tired; did not complain of pain nor seem to lose weight; no vertigo nor ear symptoms, but considerable headache for the past nine months; dyspnea and palpitation of the heart for about two months. For the last five months she had had bleeding from her gums, losing a few teaspoonfuls of blood. She had slept poorly for the last few months. Menstruation had ceased for some time, be-

ginning again three months ago. She had occasional rises of temperature to 102° F.

The patient was a very pale woman, weighing 124 pounds. There were numerous petechiæ all over the body. There was slight fetor, but the mucous membrane of the mouth was not gangrenous. The tonsils were normal in appearance. A few glands the size of a pea were to be felt in the neck and groin. The heart was not increased in size; the pulse rate was 122 per minute; and a hemic murmur was to be heard at the base and apex. The liver dulness reached to about one finger's breadth below the costal margin. Some ascites was present, as was also a moderate amount of edema of the extremities. The pelvic organs were normal. The spleen was about 22 cm. in its longest diameter; it was hard and smooth to the touch.

In accordance with the blood examination made by Dr. E. E. Smith on July 17, 1908, the diagnosis of lymphatic leukemia was made, and treatment with arsenic and the Röntgen rays was advised.

Nothing further was heard from the patient until the following December, when the report of the blood examination made by Dr. F. E. Sondern and dated December 24, 1908, was brought. In the meantime, the patient had been given sodium cacodylate, but the Röntgen rays had not been used. Several prominent consultants were seen, some of whom diagnosed the case as lymphatic leukemia, others as splenic anemia or Banti's disease. A blood report was also received from Dr. Goldhorn, dated December 21, 1908, in which he diagnosed the case as Banti's disease.

The patient finally entered the German Hospital and was subjected to the Röntgen rays the following day, but the depression and bleeding from the gums following the treatment discouraged the patient's relatives, and another consultation was held. The consultant was decided in his opinion that this was a case of Banti's disease, and a splenectomy was decided upon.

On January 6, 1909, direct transfusion was done, and on January 11, the splenectomy was performed. This was accom-

plished with but little loss of blood, and a blood examination made after the operation while the patient was still on the table showed practically the same conditions as existed before the operation. The patient at first did very well, but later went into collapse, and death resulted on January 13, 1909.

* * *

Dr. F. C. Wood said that he had examined specimens of this blood before the patient died; and, while it was rather unusual, he did not see how a diagnosis of splenic anemia or Banti's disease could be made from it. The autopsy showed the body of a slenderly built woman with extreme anemia of the skin. There was a rash over the lower extremities. There were a few ecchymoses on the outer surface of the thighs. A careful search was made for lymph nodes, but only a few small ones were found in the groins and the axilla. On opening the abdomen, the intestines were found to be distended, and 100 c.c. of a thin bloody fluid was obtained from the peritoneum. General inspection of the abdomen revealed nothing in particular. There were a few areas of fat necrosis in the omentum. The retroperitoneal lymph nodes were slightly enlarged, but not more than is often seen in other diseases. The liver was very soft and a pale yellow, and looked anemic. There was no evidence of leukemic infiltration in the kidneys. The heart was practically normal. One of the lungs showed a few hemorrhagic areas which proved to be infarcts. The intestines and stomach showed occasional petechial hemorrhages. There were no other important lesions found except in the bone marrow, which was yellow with a few reddish spots scattered about. In no place was there a diffuse hyperplasia of the marrow. The spleen was soft, with a wrinkled capsule. There were two or three rather large accessory spleens. When fresh the splenic surface was dull red, almost a chocolate color. It was soft, and did not look like a Banti's spleen. There was practically no increase in the connective tissue.

Patient: Mrs. R. B.	Dr. E. E. Smith July 17, 1908	Dr F. E. Sondern Dec. 14, 1908
Hemoglobin	43% (Fleischl)	24%
Red Cells	2,060,000 Size, small, moderate variations in shape; no microcytes. Fibrin formation not increased	1,000,000 Corpuscles generally large and somewhat varied in shape. Some poikilocytes; few microcytes. No nucleated reds found.
White cells	26,880 Polynuclears ..... 4.6% Lymphocytes..... 82. Large mononuclears and transitionals..... 13. Eosinophiles..... 0.4 Mast cells ..... 0.	27,800 Polynuclears ..... 5.2% Large lymphocytes 7.4 Small " 87.4 Other forms..... 0.
Index	1 (ratio of reds to whites 1:77)	1.2
	No malaria plasmodia. *Diag.:* Marked anemia with proportional decrease in hemoglobin and erythrocytes. Large absolute and relative lymphocytosis. These are the findings of *Lymphatic Leukemia.*	No malaria plasmodia. *Note:* Marked diminution in the amount of coloring matter and in the number of red corpuscles with a leucocytosis as stated and a marked relative lymphocytosis limited to the small type. The anemia is extreme and while the increase in leucocytes is unusually slight, it, together with the differential count would indicate a *Lymphatic Leukemia*, not a splenic anemia.

Dr. Goldhorn Dec. 21, 1908	*Before Transfusion* Dr. D. Jan. 6, 1909	*After Transfusion* Dr. D. Jan. 9, 1909
19% (Sahli)	15% (Fleischl)	30%
1,100,000 Some microcytes and poikilocytes; few washed-out corpuscles; resistance of cells poor; some polychromatophilia. No nucleated reds.	850,000	2,240,000 Some anisocytosis. No nucleated reds.
22,500 Polynuclears ..... 5.5% Large lymphocytes 11.5 Small " 78.5 Transitionals ..... 4.	11 200 Polynuclears ..... 3.% Lymphocytes..... 94. Large mononuclears 3. The polynuclears are very small, about the same size as the small lymphocytes.	8,100 Polynuclears ..... 2.% Lymphocytes..... 95. Large mononuclears 3. Polynuclears are the same size as small lymphocytes.
0.9 (minus)		
Total polymorphonuclears 1,230, as against a normal average of 4,000. Blood pressure 130. *Not a Leukemia.* Considering the blood and urinary findings in conjunction with the clinical course, I regard this as a case of Banti's disease.		

Before Splenectomy Dr. D. Jan. 11, 1909	(On operating table) *After Splenectomy* Dr. D. Jan. 11, 1909	*Day of Death* Dr. D. Jan. 13, 1909
28%	28%	23%
2,150,000 Poikilocytosis; anisocytosis. No nucleated reds.	2,090,000 Poikilocytosis; anisocytosis. No nucleated reds.	2,025,000 Poikilocytosis; anisocytosis. No nucleated reds.
8,100 Polynuclears .... 3. % Lymphocytes.... 94. Large mononu.... 2. Eosinophiles..... 0.5 Basophiles 0.5	16,000 Polynuclears ..... 3. % Lymphocytes..... 94. Large mononu..... 2. Eosinophiles ..... 0.5 Basophiles..... 0.5	18,000 Polynuclears ..... 3.% Lymphocytes..... 93. Large mononu..... 3. Eosinophiles ..... 1. Basophiles..... 0.

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A great many sections were made of the spleen and of the lymph nodes found, and particularly from the liver. The spleen was lymphoid, had lost its normal architecture, and was largely made up of lymphocytes. There was no increase of fibrous connective tissue. It looked like a leukemic spleen. A point of interest was in the capsule, which was covered with a layer of lymphocytes, four or five cells deep in some places and deeper in others where the whole tissue was infiltrated with lymphocytes. The splenic sinuses showed an infiltration of lymphocytes under the endothelium. There were a large number of plasma cells among the lymphocytes in the spleen pulp.

The lymph nodes were rather atrophic and contained very few lymphocytes. They were edematous, with large sinuses, the latter containing many phagocytes. All were of the same type, though some were rather large. There was a lymphoid infiltration of fat about the lymph nodes. The liver showed parenchymatous changes and an infiltration with lymphocytes in Glisson's capsule. The kidneys also showed a parenchymatous change.

The picture was very puzzling, and it was difficult to classify the case. It might be thought to be an aplastic anemia, but the large spleen was against that, as was also the high lymphocytosis.

What seemed to fit the case better was the diagnosis of lymphatic leukemia. Dr. Wood had seen a similar case at St. Luke's, in which the same lesions were found in the spleen, with an immense hyperplasia of the bone marrow, which was diagnosed as acute lymphatic leukemia, although the leucocytes did not run high. The probable diagnosis here, then, is lymphatic leukemia with the chief overgrowth in the spleen itself, and rather extensive involvement of the marrow. There is no hyperplasia of the bone marrow, and no hyperplasia in the nodes.

Dr. Wood said that he had not been able to find any cases in the literature which were exactly similar. Several had been reported in which the chief lesion was in the spleen, but they

were not just like this case, which was very interesting for study and discussion.

Discussion.

Dr. Richard M. Pearce said that too much stress should not be laid upon the accumulation of lymphoid cells beneath the endothelium of the splenic sinuses. This he had sometimes seen in scarlet fever, in bubonic plague, and in other infectious diseases. It was a very interesting condition, but one which occurred now and then without being peculiar to the disease with which it appeared to be associated.

Dr. Wood replied that he was aware that lymphoid infiltration was seen in some infections, but in going over a large series of spleens he had not found such lesions in non-infected cases, and under the circumstances it seemed rather interesting that he should have two recent specimens—one an undoubted lymphatic leukemia, and this one—both showing the same lesions.

A CASE OF STOKES-ADAMS' DISEASE.

L. F. BISHOP, M.D., AND J. H. LARKIN, M.D.

Dr. L. F. Bishop presented the clinical history of a case of Stokes-Adams' disease which he described as the most typical and classical one he had ever seen or read of.

The patient, T. M., was admitted to the Lincoln Hospital on October 13, 1908, and died October 22, 1908. His family history was negative. He had previously had no important illness except measles, whooping-cough, and smallpox when a child. Later he had had muscular rheumatism, and twenty-five years ago had had a sunstroke; but he had always

been considered a healthy, strong, hard-working Irishman. He drank whiskey moderately. There was no history of syphilis.

On October 12, while in bed, he felt as though he were whirled around, and had a great buzzing in his ears, especially the right one, in which he had been gradually growing deaf. After that he had three similar attacks, and came to the hospital complaining chiefly of these attacks and of feeling weak. He said that the attacks and vertigo came on without premonition, and that between the attacks he felt perfectly well, excepting that he was weak.

On admission, he appeared to be a fairly well-developed but poorly nourished man. The pupils reacted to light and accommodation. The tongue was coated; the lungs were negative; the heart was in the median line; there was no murmur. The heart beats registered thirty-six per minute; the beats in the neck three to one at the apex. The abdomen was negative. The extremities showed nothing. It was a very brief and negative history, and the findings in the case were chiefly objective.

Photographs showed the patient sitting up in bed, and again shortly after one of these attacks, and depicted the attitude and expression of extreme exhaustion and depression. The jugular tracings were also presented, showing the much more rapid pulsations in the vein and the extremely slow apex beat.

The case was a typical one, and the diagnosis was made by the Junior half an hour after the patient was admitted to the hospital. There was no doubt about the diagnosis.

* * *

Dr. J. H. Larkin said that there was little to say about this curious case of Stokes-Adams' disease. He had seen a number of these cases and had been trying to collect them in such a way as to make definite microscopical examinations of the various conditions found. This particular heart lesion seemed to be of the calcareous type. In the aortic vestibule there was diffuse thickening of the endocardium, a retraction and thickening of the mitral valve, and diffuse calcification in

the region of the bundle of His; otherwise the heart showed little change. The cavity was only moderately dilated; there was a normal amount of musculature, and a slight amount of atheroma in the aorta. The lesion in this heart appeared to be in the typical place in the vestibule.

Outside of the microscopical condition there was nothing of particular interest, the main interest centering in the clinical history.

The case was one of the most marked types seen at autopsy. It seemed probable that the hearts were not examined in the course of ordinary autopsies as completely as they should be. For the past few years Dr. Larkin had been systematically collecting hearts, for the purpose of making a thorough and systematic study, and he had now between 150 and 180 hearts which he intended to examine without knowing anything about the history.

It did not seem probable that the microscopic examination of these calcified hearts would yield very much information. In other hearts where there were tumor and sclerosis of the aortic valves, and where there were gummatous infiltrations, one was more likely to get correct information in regard to the bundle of His. In the sheep heart, the bundle of His could be dissected out, but this was impossible in the human heart. Dr. Larkin had a number of sheep hearts which had been examined microscopically, and thought there was a great discrepancy of opinion as to the nature of this bundle, whether it is a pure muscular or a nerve bundle. He was inclined to throw over the idea that it is a muscle bundle. He had put a number of normal and abnormal hearts through the Cajal method of staining, and felt that he had demonstrated certain points in regard to the bundle, topographically and microscopically. It was at least mixed with nerves, if not entirely composed of nerve fiber, and at present he was more inclined to view this condition as one allied to a nerve lesion in the so-called bundle of His.

Further microscopic work must be done on many hearts in regard to the lesions which we find so prominent in and

around the aortic vestibule, and it would be well for those working along this line to study them carefully to obtain more knowledge regarding the cardiac nerve fibers and the so-called bundle of His, as to whether it is a nerve bundle or a muscular structure.

ON THE TYPE OF CULTURES FROM OLD CUTANEOUS TUBERCLES OF BUTCHERS.

ALFRED F. HESS, M.D.

(From the Research Laboratory, Department of Health, New York.)

It is now generally conceded that the tubercle bacillus of cattle at times incites tuberculosis in man. This conclusion has been definitely established only through the possibility of distinguishing between a bovine and a human type of bacillus, and through employing this method and isolating the bovine type of organism from human tuberculous infections. The studies thus far carried out in different countries, using the same methods of differentiation, agree in charging the human bacillus with a marked preponderance of infections. In this connection, however, there is one disturbing criticism that is now and again brought forth to shake the confidence imposed in these conclusions, based as they are on the differentiation of the types of bacilli. It is claimed by some capable workers that it is possible for the bovine bacillus to be so altered by years of sojourn in the human tissues that its essential characteristics become altered and it simulates the human type of bacillus. Without doubt, if this metamorphosis can readily take place, some of those infections which we now believe to have been of human origin may well have had their source in bovine infections of years ago, and it is to no purpose to designate them as human. In fact, if this were so, the entire method of differentiation which

has accomplished so much in the past decade, and promises so much more in the practical and theoretical study of tuberculosis, would have to be regarded as not only unreliable, but misleading.

The main difficulty in studying this question in man is that we are rarely certain of the nature of the original infection, and accordingly cannot judge of the change of type. Our main reliance is generally circumstantial evidence. An exception to this rule, however, is furnished by those few cases of inoculation tuberculosis where the bovine source of infection is definitely known. I have with difficulty found two cases of this nature, both in slaughter-house workers, and report a study of them, coupled with some other experiments relating to the stability of the types of tubercle bacilli.

Case 1. This man had been employed in his present trade for seven years. Four years ago, while slaughtering an animal, he cut the middle finger of his right hand on the pointed end of a rib. He gave no thought to this injury until he found that it was slow to heal; he then merely applied various ointments. Gradually a nodule appeared at the site of the wound which assumed its present condition. He was aware of the tuberculous nature of this nodule, and in fact directed me to another worker who had the same skin lesion. I shall not enter into a minute description of the appearance of this nodule. It was the size of a large pea, brownish red and very firm in consistency. The glands at the elbow and axilla were not enlarged. The general health of the man was excellent.

Case 2. This case was very similar to the previous one. This man, while slaughtering a tuberculous cow, cut himself with a knife across the knuckles. This accident happened about six years ago. He remembered the date, as he was forced by this disability to quit work for some weeks and to enter the employment of another firm. As in the previous instance, a nodule appeared at the site of injury. The nodule was situated over the fourth left metacarpal joint, and resembled the tubercle described in the previous case, excepting that its surface was rougher and papilliform. This man also was healthy

to all appearances; however, a large hard epitrochlear gland was palpable at the right elbow.

Both of these men were induced to have these nodules excised. After excision the surface of the growths was removed, and they were thoroughly washed in sterile water. Two guinea-pigs were inoculated subcutaneously with each growth. All four animals developed tuberculosis. It is not necessary for me to give in detail the method of isolating tubercle bacilli from the tissues or the criteria for differentiating the types. The method employed was that now generally followed and made use of by me in previous studies. The cultural growth from these two cases proved to be very similar; in fact I could not distinguish between them. They both grew sparsely on egg media. They also showed a high degree of virulence for rabbits, producing a generalized tuberculosis when inoculated intravenously in the dose of one milligram. In other words, they were typically bovine.

Before discussing these results I shall describe an experiment undertaken with the object of transforming the bovine type of the tubercle bacillus into the human type. An attempt was made to produce a culture medium resembling in its composition as closely as possible the human tissues. From the outset the inherent variance between an artificial culture medium and the living tissues was clearly realized. For this purpose, however, what may be termed a "human-placenta glycerin broth" was devised. Human placenta was obtained under strict aseptic precautions and from this a broth was made, treating the placenta just as the beef is treated in preparing the broth for common use. One per cent. peptone, one-half per cent. salt, and five per cent. glycerin were added. The entire preparation of this culture medium was conducted with all possible aseptic precautions. In order not to destroy the complement of the human placenta, heat was applied only to 55° C. It was possible, in most instances, to obtain a sterile broth by means of filtration through a Berkefeld filter.

Two bovine strains of known virulence, one of them hav-

ing been under artificial cultivation for many years, the other only recently isolated, were grown upon this culture medium for nine months, comprising eight generations. At the end of this period their virulence for rabbits was found to be as marked as at the beginning, showing that in this respect they had not approached the human type. In fact the only change that was noted was one to be anticipated from artificial cultivation of any nature, namely, a greater facility of growth in the case of the strain which had been the more recently isolated. As this experiment was very laborious, and promised so little, it was discontinued.

The question of the stability or variability of the types of tubercle bacilli has been discussed so frequently that I shall not review the testimony. However, in connection with this report, a few words upon this subject seem in place. From the outset it should be realized that this question has a practical as well as a theoretical aspect, and that the two need not be in absolute accord. The former considers whether it is in any way possible, by natural or artificial means, to convert one type of bacillus into another type; the latter whether the bacilli isolated from man and designated as human have been converted in his tissues from an original bovine type. These two viewpoints must not be confused. It is true it has been demonstrated that under artificial cultivation strains may be greatly changed in their cultural and biological characteristics. Indeed, a culture isolated almost ten years ago from a cow, and kindly sent to me by Prof. Leonard Pearson, I recently found to simulate the human type both in luxuriance of growth and diminished virulence for rabbits. However, even after this long period of artificial cultivation, its virulence was still greater than that of cultures of the human type. Another bovine culture of about the same age was found to be markedly virulent for rabbits. However, such experiments clearly cannot be translated into practical evidence on this question. Again, it may be advanced that experiments have been reported showing a conversion of human into bovine bacilli by means of passage through cattle or of bovine into avian ba-

cilli by means of passage through birds. However, even if we accept these interpretations, and forego the criticism that has been levelled at them justly by others, we find these experiments to be very few in number and far outweighed by the many others where no conversion of type was effected. When we consider the practical side of this question and draw our arguments from what we know of tubercle bacilli in man, the following should be borne in mind: It is true, atypical types have been isolated by many investigators, strains neither typically human nor bovine. This intermediate group may, in part, be accounted for by attributing the variation to a change of environment, for example, of bovine bacilli in the new environment of human tissue. These atypical strains, it should be remembered, are exceptional; among three bovine and four human strains which I have isolated from man none belong to this category. Furthermore, this deviation from type cannot be regarded as evidence of the possibility of a complete change of type. In this connection it is worthy of note that typical bovine bacilli have been isolated from calcareous lymph nodes of human beings; in such instances the bovine bacilli must have existed in the human tissues for years without undergoing transformation. It has never been shown that the older the tuberculous lesion the less the likelihood of isolating bovine bacilli from man; and yet this corollary should obtain if the bacilli are readily converted in the human tissues. The question may be approached from another point of view. It is well known that no case of primary pulmonary tuberculosis has been indisputably proved to have been incited by the bovine bacillus. These cases form the great mass of tuberculosis and have been studied more than all others. If this form of the disease is due, in some instances, to a bovine bacillus which has been transformed in the human body, we should at least occasionally meet with this type of the bacillus in the early stage of the disease before it has been converted into the human type. Not only do we know that this is not the case, but we find that even the intermediate types are rarely met with in the primary pulmonary cases. So that it would seem

from a practical standpoint the question of transmutation of types may well be disregarded, and we can safely continue to investigate the etiology of tuberculosis by means of differentiating the types of bacilli.

The two cases of cutaneous tuberculosis which I report claim some degree of interest because they constitute bovine infections occurring in adults. The fact that they remained localized should not be attributed to the low degree of virulence for man of the bovine bacillus, as it is well known that cutaneous affections due to the human type of bacillus, such as lupus or the "anatomical tubercles" contracted in the dissecting room, likewise do not tend to systematic invasion. Their main significance, however, lies in the fact that they furnish exceptional instances of bovine tubercle bacilli which have lived in the human tissues for many years without acquiring characteristics of the human type. From this point of view they constitute evidence against the conversion in the human tissues of bovine bacilli into human tubercle bacilli. It would be interesting and of undoubted value if those who have access to similar long-standing cases of tuberculosis would make them the basis of a bacteriological study.

A MEDIASTINAL TUMOR WITH INVOLVEMENT OF THE LUNG, PERICARDIUM, AND HEART: SYPHILIS OF THE LUNG.*

LINDSAY S. MILNE, M.D.

The specimen of a mediastinal tumor was obtained at the autopsy on an Italian, thirty-six years of age, who had originally come under observation for pain in the upper part of the front of the chest and cough. The commencement of his illness had

* To be described in detail in the Publications of the Russell Sage Institute.

dated back three months and had been associated with a progressively developing edema of the right side of the face and neck, the right upper extremity, the right side of the chest and abdomen, and the scrotum and penis. During the last two weeks of his illness he had complained of some dysphagia for solid foods, and had also suffered from severe spasms of tracheal coughing.

On physical examination, it was found that the veins on the front of the chest, particularly on the right side, were very much distended. The heart was extensively displaced downward and to the left, and it was of interest to note, considering the condition of the heart disclosed at autopsy, that there were no audible cardiac murmurs. The entire right side of the chest was absolutely dull on percussion, due to some extent to large quantities of slightly blood stained serous fluid which, from time to time, were removed from the pleural cavity. Over the front of the sternum, down to the level of the fifth rib and to some distance on either side, there could be heard loud conducted tracheal breathing, but no heart sounds. The lower border of the liver apparently extended down two inches below the costal margin in the right nipple line.

The blood, besides showing a moderate degree of anemia of a secondary type, contained an average of 10,000 leucocytes per c. mm.; polymorphonuclears, 83.2 per cent.; lymphocytes, 13 per cent.; large mononuclears, 2 per cent.

In the course of his illness emaciation was extremely rapid and the edema rapidly increased, spreading slightly to the legs and to the left side of the body before death occurred.

The autopsy showed that the diaphragm was practically flat with the lower costal margin, and that the liver, in consequence, had been displaced downwards. Both pleural cavities, but especially the right, contained a large amount of slightly blood stained fluid. The mediastinum was largely occupied by a large, oval, coarsely nodular tumor mass which extended upward one and one-half inches above the level of the episternal notch and downward to the level of the junction of the fifth rib with the

sternum. Laterally, it extended two-thirds on either side of the sternum, and separated the heart from the right lung. The tumor was white in color and firm in consistence, although it showed in its interior numerous soft necrotic areas. The pericardial cavity contained about eight ounces of reddish serous fluid and an irregular nodulated mass had grown through the upper part of the sac by direct extension from the parent mediastinal tumor. The auricles also were each invaded through the upper posterior part of the wall by a large polypoidal mass, which, in the case of the right auricle, hung down in the cavity nearly to the orifice of the inferior vena cava. The right lung was also extensively invaded by direct extension from the region of the root, without there being any isolated metastases. Probably, as the result of vascular obstruction, there were numerous infarcts in the right lung. The right bronchial glands, also some of the glands along the right side of the bodies of the upper dorsal vertebræ, and some of the glands in the lower part of the right side of the neck, were considerably enlarged from tumor infiltration. In no part was there any direct connection of the tumor with any bony structure, nor were there any isolated metastases through the rest of the body. The esophagus, trachea, aortic arch, and pulmonary artery were in practically their normal relationships, and although embedded in tumor substance were not obviously invaded in any part. The channels of the larger veins involved in the tumor seemed clear, although the lumen of the right innominate and azygos major veins appeared very compressed.

Microscopically, the growth is a lymphosarcoma of a comparatively active growing type. The component cells are slightly larger than normal lymphocytes, both in their nucleus and cytoplasm. Extension is chiefly along the lines of the lymphatics, and this is associated with a marked surrounding zone of inflammatory reaction. When an air alveolus of the lung has become penetrated by tumor cells, its lining cells generally appear swollen up, and frequently are observed to be desquamated and also to be highly phagocytic to the invading tissue.

As regards the origin of this growth, it would seem to be derived from the lymphatic gland structures of the mediastinum, or possibly from the thymus gland. It has been considered by Kaufmann and others that growths of the lymphatic glands of the mediastinum more usually produce metastases and are more nodular than are growths from the thymus. Virchow also stated that thymus tumors were particularly liable to invade the pericardium. In relation to the possibility of this tumor having its origin in the thymus gland, and considering the known reciprocity in activity between the thymus and thyroid, it is interesting to find that the thyroid in this case was very considerably enlarged, measuring 4.5 cm. vertically in both its lobes. It was quite distinct from the tumor growth and, both grossly and microscopically, presented the proliferative appearances characteristic of the thyroid in exophthalmic goiter.

The specimen illustrating syphilis of the lung was obtained at the autopsy on a woman, forty-four years of age, who had been admitted to the hospital in a very stupid semi-comatose state and with convulsive movements of the hands. Practically no history was obtainable, beyond the facts that she had been troubled with pains in the head and legs for seven years, and that she was a very heavy drinker.

She was a married woman and had had three children, all of whom died in infancy. There had been no miscarriages. As regards the occurrence of syphilis, nothing whatever could be found out. While in the hospital she was noticed to have albuminuria, and a week after admission deep coma developed, and she died in a state of convulsions.

At the autopsy it was noticed that she had very numerous definitely syphilitic scars over the forehead, limbs and trunk. Most of these scars were old, but several over the buttocks were more recent in appearance, and over the outer part of the right buttock there was a large area of ulceration into the subcutaneous tissues.

The kidneys were very small and granular, being in an advanced state of chronic productive nephritis. There was also a

very extreme degree of general arteriosclerosis and the brain was very edematous.

The liver was somewhat smaller than normal, and its surface showed extensive fibrous perihepatitis. Its interior showed a slight degree of early cirrhosis, and microscopically it was evident that the fibrous tissue was of comparatively recent date, and that there were unusually large perivascular lymphocyte collections in this fibrous overgrowth.

The spleen was somewhat atrophic and showed a considerable increase in the thickness of its fibrous stroma.

On opening the pericardial cavity, it was found to contain about six ounces of clear, slightly blood stained fluid, and that the entire serous surface was covered by fibrinous lymph in which organization was just commencing. The tongue presented no smooth atrophy, nor was there any special change in the larger air passages. The bronchial glands were slightly enlarged and pigmented.

Neither pleural cavity contained any fluid, nor was there any evidence of recent pleurisy. Numerous old adhesions, however, united the two surfaces of the pleura, and the lower lobe of the right lung was inseparable from the corresponding vault of the diaphragm. The left lung was, as a whole, very emphysematous; in the upper lobe there was a large patch of gray hepatization pneumonia, and irregularly through the lower lobe there were also some small bronchopneumonic areas, several of which had broken down into small abscesses. The lower lobe presented a very dense reticulum of old fibrous tissue. This fibrous formation was much more condensed at the extreme lower margin of the lung, and in this position quite large areas of the lung appeared to be almost completely fibrous. The upper lobe was practically free of this fibrous overgrowth, save in its lower part, where only a very delicate reticulum was present.

The right lung showed almost similar changes, but the fibrosis in the lower part of the lung was even more dense. An area, about 2 cm. long by 1 cm. broad, at the extreme lower mar-

gin of the lung and attached firmly to the diaphragm, seemed almost uniformly fibrous in composition. An inch and a half above the lower posterior margin of the lung, a long scar extended from the surface deeply into the interior. There were several other scars, not quite so large, which extended in from the surface into the interior of the lung in its lower part, and which evidently were the results of cicatrization of gummata. Throughout this right lung also there were several patches of bronchopneumonia and a few abscess foci also were present.

Microscopically, the pneumonic areas appeared to be ordinary pneumococcic gray hepatization areas, and the breaking down foci contained some staphylococci, as well as pneumococci. There were no tubercle bacilli obtainable in any part of the lung, nor indeed were there any histological appearances of tuberculosis to be observed. The stroma of fibrous tissue, which pervaded the lower lobes of the lung, seemed for the most part to be composed of comparatively dense fibrous tissue, which included occasional distorted acinus-like air alveoli, and also very evident perivascular lymphocyte nodes. In some places obliterative processes in the vessels were also a prominent feature. Besides this old standing fibrous deposit, there were also the connective tissue elements were very young, and the air alveoli in these areas showed a varying degree of distortion, and the lining cells of most of them were markedly swollen and sometimes desquamated, giving an almost adenomatous appearance to the tissue. All gradations between this early connective tissue overgrowth and the dense fibrous bands, which contained only a few distorted remnants of the alveoli, could be observed.

In conclusion, there is no doubt in my mind that, notwithstanding the fact that spirochetes could not be demonstrated, this fibrosis was syphilitic in origin.

This idea is based on several facts, such as the distribution in the lower lobes of both lungs in a patient who was definitely syphilitic. Also on the formation of such extensive scars, and particularly in the case of the right lung, the fibrous mass which involved the diaphragm, and the thick cicatrices just above it

in the lung substance. The fibrosis also appeared older and more irregular in distribution and in histological appearance than what is commonly seen as a result of ordinary productive pneumonia, or from what might be imagined to follow any pleurogenic condition.

Microscopically, there was evidence of some continued process, as there were such great variations in the ages of the reactive inflammatory tissues. The vascular changes also were in favor of a syphilitic lesion.

The fact of this being a primary syphilitic process seems to me more correct than to consider it as a secondary result of a pneumonia which, on account of a syphilitic tendency, has occasioned subsequent fibrosis.

Discussion.

Dr. R. Grace, referring to the case of mediastinal tumor, asked whether the edema of one side of the face and neck was ascribed to organic obstruction, or to some result of the growth, as toxemia, or whether it was to be considered angio-neurotic in origin.

Dr. H. Oertel asked whether any member present had ever seen a similar combination of thyroid tumor and mediastinal growth.

Dr. J. H. Larkin said that three or four years ago Dr. Collins had removed a tumor from the suprasternal notch in a woman who had difficulty in breathing. He had made quite a large incision and taken out a lot of tissue, which on examination proved to be of thyroid origin. The operation was undertaken to relieve dyspnea; the pressure was so great and the position of the tumor such that to remove it was impossible. Three or four months later the woman died with a marked infiltration of the mediastinum. This was apparently a rapidly growing tumor of the mediastinum with marked thyroid characteristics. This was the only time he had ever found thyroid

tissue invading the mediastinum, and it had all the evidences of a malignant growth.

Dr. Oertel said that one could not recognize the mediastinal growth as being of thyroid derivation in this case.

Dr. Larkin said that he had simply cited the case as being suggestive—the rapidity of the growth after operation, and subsequent death. There might have been another tumor there at the time, which they had had no means of determining, but the case was very suggestive in view of the beautiful specimen presented.

Dr. F. C. Wood said that he had seen a large mediastinal growth of the thymus with some hyperplasia of the thyroid, but not to such a degree as this. There was a very large mediastinal growth, but it was from the thymus gland, and was not a lymphosarcoma.

Dr. Milne said that although there were certain veins in the thorax which were obstructed, yet it was not easy, anatomically, to account for the unilateral edema.